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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/015,926

Applicant(s)

KRISHNAMURTHI ET AL.

Examiner

SALMAN AHMED

Art Unit

2419

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/10/2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 5-68 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 1, 2, 5, 57, 58, 64 and 66 is/are allowed.
6) ☒ Claim(s) 6-53 and 56, 59-63, 65, 67 and 68 is/are rejected.
7) ☒ Claim(s) 54 and 55 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 12/10/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Final Drawing Review (PTO-849)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/14/2009
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claims 1-2 and 5-68 are pending.

Claims 6-53 and 56, 59-63, 65, 67 and 68 are rejected.

Claims 1, 2, 5, 57, 58, 64 and 66 are allowed.

Claims 54 and 55 are objected to.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 68 is rejected under 35 U.S.C. 112, first paragraph as being a single means claim. A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983).
3. Claim 66 is rejected under 35 U.S.C. 112, first paragraph as being a single means claim. A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983).

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 2419

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 68 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. Claim 68 in line 6 states "each loop back packet covers zero or more test packets", while in line 7 states "includes a transmission source and a sequence number of each covered test packet". It is unclear how can a loop back packet covering zero test packet can also include any data (source and sequence number) related to covered test packets. As such, claim 68 is indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
7. Claims 29, 31, 39, 61, 63, 67 has similar issues.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 6, 7, 8, 10, 28, 29, 30, 31, 39, 61, 63, 67 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakadura et al. (US PAT 5357557), hereinafter referred to as Sakadura in view of Engbersen (US PAT 6031845, hereinafter Engbersen).

In regards to claims 6, 7, 8, 10, 30 and 31 Sakadura teaches a method for testing one or more channels in a wireless data communication system (system in figure 2), comprising: receiving a first data transmission comprising test packets of known test data via a first channel (column 3 lines 1-5, the test data is predetermined pattern data, e.g., "100111001". These test conditions are input through the console 11 for each terminal to be sequentially down-loaded (i.e. received) therein. The channel and direction used to transmit this pattern from cellular automobile telephone exchange 20 to terminal 31 is interpreted as first/forward channel); identifying parameter values descriptive of the test packets in the first data transmission and excluding known test data, forming a second data transmission with the identified parameter values for the received test packets; and transmitting the second data transmission via a second channel (column 3 lines 40-44, Upon reception of the accumulated test result, the start-point terminal 31 transmits the result (i.e. interpreted as loop back packets) to the cellular automobile telephone exchange 20 upon making the call C5. The channel and

direction used to transmit this pattern to cellular automobile telephone exchange 20 from terminal 31 is interpreted as second/reverse channel).

Sakakura does not explicitly teach parameter values for each test packet comprise at least one of a serving sector from which the test packet was received, a sequence number of the test packet, and a length of the test packet. In regards to claim 8, Sakakura teaches the second data transmission comprises a plurality of loop back packets but does not explicitly teach loop back packets include the parameter values descriptive of the test packets.

Engbersen teaches (abstract, column 19 lines 17-20, For detecting errors, the test information would include an input address indicating the source of the test packet, a sequence number defining the order in which the packet should arrive at the destination, time bits relating to the packet length and/or to the expected packet transmission delay, and a cyclic redundancy code which covers the entire contents of the test packet, including its control portion. Each analyzer at a receiving station operates autonomously from the senders and processes all received traffic in real-time; this enables it to recognize all defined system errors, even those occurring with very low probability, at the packet level. Based on this information, the transputer either performs statistical computations (e.g. counting of the faulty events) (i.e. interpreted as updating variables)). Further, in regards to claims 30 and 31, regarding packet error rate, Engbersen teaches error detection is performed by analyzing the arriving packets at the output of the assumed fault path for unexpected contents.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sakakura's system/method with the steps of parameter values for each test packet comprise at least one of a serving sector from which the test packet was received, a sequence number of the test packet, and a length of the test packet as suggested by Engbersen. The motivation is that (as suggested by Engbersen, abstract) such method enables analyzer at a receiving station operates autonomously from the senders and processes all received traffic in real-time; this enables it to recognize all defined system errors, even those occurring with very low probability, at the packet level. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 28 Sakakura teaches a memory communicatively coupled to a digital signal processing device (DSPD) (figure 1, apparatus 20 having associated processor and memory) and teaches all the limitations of claim 6 above and are rejected using the same rationale.

In regards to claim 68, Sakakura teaches an apparatus (Figure 2, cellular automobile telephone exchange 20) in a wireless data communication system comprising: means for processing a plurality of test packets of known test data for transmission via a forward traffic channel (column 3 lines 1-5, the test data is predetermined pattern data, e.g., "100111001". These test conditions are input through the console 11 for each terminal to be sequentially down-loaded therein. The channel

and direction used to transmit this pattern from cellular automobile telephone exchange 20 to terminal 31 is interpreted as forward channel); means for processing a plurality of loop back packets received via a reverse traffic channel, wherein each loop back packet covers zero or more test packets, excludes known test data, and includes a transmission source (column 3 lines 40-44, Upon reception of the accumulated test result, the start-point terminal 31 transmits the result to the cellular automobile telephone exchange 20 upon making the call C5. The channel and direction used to transmit this pattern to cellular automobile telephone exchange 20 from terminal 31 is interpreted as reverse channel).

Sakakura does not explicitly teach a sequence number of each covered test packet; and means for updating a plurality of variables for a plurality of transmission sources based on the transmission source and the sequence number of each test packet covered by the received packets.

Engbersen teaches (abstract, column 19 lines 17-20, For detecting errors, the test information would include an input address indicating the source of the test packet, a sequence number defining the order in which the packet should arrive at the destination, time bits relating to the packet length and/or to the expected packet transmission delay, and a cyclic redundancy code which covers the entire contents of the test packet, including its control portion. Each analyzer at a receiving station operates autonomously from the senders and processes all received traffic in real-time; this enables it to recognize all defined system errors, even those occurring with very low probability, at the packet level. Based on this information, the transputer either performs

statistical computations (e.g. counting of the faulty events) (i.e. interpreted as updating variables)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sakakura's system/method with the steps of a sequence number of each covered test packet; and means for updating a plurality of variables for a plurality of transmission sources based on the transmission source and the sequence number of each test packet covered by the received packets as suggested by Engbersen. The motivation is that (as suggested by Engbersen, abstract) such method enables analyzer at a receiving station operates autonomously from the senders and processes all received traffic in real-time; this enables it to recognize all defined system errors, even those occurring with very low probability, at the packet level. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 67, Sakadura teaches an access point (Figure 2, cellular automobile telephone exchange 20), a transmit data processor (figure 2, base station unit 15), receive data processor (figure 2, base station unit 15) while Engbersen teaches a controller (transputer) and teaches all the limitations of claim 68 and claim 67 is rejected using similar rationale.

Claim 29 teaches all the limitations of claim 68 above and thus rejected using the same rationale.

In regards to claim 39 Sakadura teaches a memory communicatively coupled to a digital signal processing device (DSPD) (figure 1, apparatus 20 having associated processor and memory) and teaches all the limitations of claim 68 above and are rejected using the same rationale.

In regards to claims 61 and 63 Sakadura teaches all the limitations of claims 68 and 67 above and are rejected using the same rationale.

4. Claims 62 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakadura et al. (US PAT 5357557), hereinafter referred to as Sakadura in view of Engbersen (US PAT 6031845, hereinafter Engbersen) and Kobayasi.

In regards to claim 62 and 65 Sakadura and Engbersen teaches all the limitations of their respective independent claims above but do not explicitly teach a queue for the test packets.

In regards to claims 62 and 65 Kobayasi teaches buffers (fig 132) for data packets.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sakadura and Engbersen's teaching by incorporating the loopback test scheme as taught by Kobayasi. The motivation is that (as suggested by Kobayasi column 317 lines 29-34) the present invention realizes an efficient test within a short time by performing a test cell loopback check, which has been made in a test device, through a test program in the switch. Additionally, transmitting cell data from a test device requires no testing units because the loopback jig can replace the testing

units. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

5. Claims 11-13, 15-20, 22, 23, 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakadura and Engbersen as applied to claim 8 above and further in view of Kobayasi.

In regards to claims 11, 12, 13, 15-20, 22, 23, 25, 26 and 27 Sakadura and Engbersen teach a method for testing one or more channels in a wireless data communication system, comprising: receiving a plurality of test packets via a forward traffic channel as described in the rejections of claim 8 above.

Sakadura and Engbersen do not explicitly teach of having protocol type, packet type, number of records field, time interval, source address, sequence number in the test packet.

Kobayasi in the same field of endeavor teaches protocol type, packet type, number of records field, time interval, source address, sequence number in the packets shown in FIGS. 582 through 628. In regards to claims 13 and 20 Kobayasi teaches (column 3 lines 5-10) that since the source SW station 3 and the terminal SW station 6 mark the time stamp onto the payload field of the packet, the OS center 1 is informed of the transmission time of packets according to the information.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sakadura and Engbersen's system/method by incorporating the loopback test scheme as taught by Kobayasi. The motivation is that (as suggested by Kobayasi column 317 lines 29-34) the present invention realizes an efficient test within a short time by performing a test cell loopback check, which has been made in a test device, through a test program in the switch. Additionally, transmitting cell data from a test device requires no testing units because the loopback jig can replace the testing units. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

6. Claims 32-33 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen in view of Walding, Dipperstein and Gillespie (US PAT 6014377).

In regards to claims 32 and 33 Numminen teaches a method for testing the forward link for specific configuration of one or more auxiliary channels (column 11 lines 4-6, traffic and control channels) in wireless data communication system, comprising: receiving a first message having included therein test settings selected *from among a plurality of possible test settings* (column 7 lines 18-20 and column 11 lines 4-6, test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel (i.e. data, traffic or control channel).

Applicability of the invention to all mobile communication systems in which a mobile station can operate on data, traffic and control channels (i.e. plurality of possible test settings are related to testing data, traffic or control channel)) for one or more auxiliary channels (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, (after selecting data, traffic or control channel) the test equipment sends an immediate assignment 503 which may include various instructions (i.e. record) for the mobile station. Particularly the immediate assignment 503 contains so-called test octets (i.e. record) in which the first two bits indicate the contents of the test of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values can be reserved to indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode); configuring each auxiliary channel based on test settings applicable to the auxiliary channel (column 7 lines 46-50, At first the test equipment sends a comparison and statistical operation start command associated with the data channel, which command can be called CLOSE_Multi-slot_loop_CMD. The close command may include an identifier on the basis of which the mobile station identifies the G loop. Numminen further teaches (column 11 lines 4-6) mobile station can perform testing on traffic and control channels (i.e. auxiliary channel) as well); and transmitting each configured auxiliary channel on reverse link in accordance with the applicable test settings (column 2 lines 24-31, The method according to the invention is characterized in that it is comprised of steps

wherein a test signal is received in the downlink direction, the test signal received is compared with a known form of the test signal, information produced by the comparison about errors detected in the received test signal is stored, and a signal representing the information stored is sent uplink) to test the configured auxiliary channel (column 7 lines 18-20 and column 11 lines 4-6, test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel. Applicability of the invention to all mobile communication systems in which a mobile station can operate on data, traffic and control channels (i.e. overhead or auxiliary channels)). Numminen teaches in column 1 lines 35-40, Tests usually employ a technique in which a mobile station receives a downlink frame from the SS and sends back to the SS a corresponding uplink frame which contains the equivalent number of bits. The mobile station may even recycle to the SS the same individual bits that it received in the downlink direction.

Numminen teaches auxiliary channel (column 11 lines 4-6, traffic and control channels), but does not explicitly teach auxiliary channel carry signaling.

Walding in the same field of endeavor teaches the overhead channel (i.e. auxiliary channel) is provided for carrying control information (i.e. signaling packets) used to establish and maintain the downlink and uplink communication paths (column 1 lines 48-50).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's system/method by incorporating the steps of signaling data being sent via auxiliary channel as suggested by Walding. The motivation

is that (as suggested by Walding, column 1 lines 48-50) the overhead channel (i.e. auxiliary channel) is provided for carrying control information (i.e. signaling packets) used to establish and maintain the downlink and uplink communication paths. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Numminen and Walding does not explicitly teach test settings selected comprise indications for configuring each channel and indications of procedures to be performed by each channel during testing.

Dipperstein in the same field of endeavor teaches test settings selected comprise indications for configuring each channel and indications of procedures to be performed by each channel during testing (column 3 lines 11-17, claims 6, 13 and 14, In accordance with the eoc-based message exchange sequence, a user or craftsman operating a sourcing test set (as an LT device at the central office) activates a MENU key on the test set keypad, which causes the test set's LCD display panel to display a list of options (i.e. test settings indications) available to the user, one of which is a bit error test (BERT). in response to a user invoking an input/output element of test set associated with a bit error test, conducting a command-response message exchange over auxiliary ISDN channel, through which device clears loopbacks, and then loops back one or more ISDN bearer channels (i.e. traffic channel), and supervisory control processor is operative, in response to a user invoking an input/output element of test set associated with a bit error test, to conduct a command-response message exchange

over auxiliary ISDN channel, through which device clears loopbacks, and then loops back one or more ISDN bearer channels and, in response to far end device looping back one or more bearer channels, conducting a bit error rate test over looped back one or more bearer channels, and providing an indication of a result of bit error rate test supervisory control processor is operative, in response to a user invoking an input/output element of test set associated with a bit error test, to provide a list of prescribed test parameter options for entry by the user and, in response to said user entering test parameter options, to transmit a first command message over auxiliary ISDN channel instructing device to clear loopbacks and, in response to device clearing loopbacks, to transmit a second command message over auxiliary ISDN channel instructing device to loop back said one or more ISDN bearer channels).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Walding's system/method by incorporating the steps of test settings selected comprise indications for configuring each auxiliary channel and indications of procedures to be performed by each auxiliary channel during testing as suggested by Dipperstein. The motivation is that by providing indications for configuration of various different channels the test environment becomes robust and flexible and enables a test set and a remote device, exchange digital communication messages over various designated channels that are effective to cause the device to provide a loopback path over at least one channel to the test set and test a prescribed operational characteristic of the link. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on

design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Numminen, Walding and Dipperstein do not explicitly teach testing Auxiliary control channel.

Gillespie in the same or similar field of endeavor teaches testing Auxiliary control channel (column 5 lines 55-58).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen, Walding and Dipperstein's system/method by incorporating the steps of testing Auxiliary control channel as suggested by Gillespie. The motivation is that such method enables the system to diagnose all channels of communication for performance, reliability and interference among other things; thus making the system optimum. Known work (i.e. diagnose all channels) in one field of endeavor (Gillespie prior art) may prompt variations of it for use in either the same field or a different one (Numminen, Walding and Dipperstein prior art) based on design incentives (i.e. performance, reliability and interference) or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claims 35-37 Numminen teaches the first message includes a test setting for a particular bit value to be transmitted on an acknowledgment (ACK) channel (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station. Particularly the immediate assignment 503 contains so-called rest octets in which the first two bits indicate the contents of the rest of the rest octet. By the

priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values can be reserved to indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode) or the first message includes a test setting (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station. Particularly the immediate assignment 503 contains so-called rest octets in which the first two bits indicate the contents of the rest of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values can be reserved to indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode) for a particular value to be transmitted on a data rate control (DRC) channel or the first message includes a test setting (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station. Particularly the immediate assignment 503 contains so-called rest octets in which the first two bits indicate the contents of the rest of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values

can be reserved to indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode) for a particular cover to be used for a data rate control (DRC) channel (column 6 lines 20-61).

In regards to claim 38 Numminen teaches the first message includes a test setting indicative of maintenance of a test mode in event of a connection closure or a lost connection (column 7 lines 18-20, So test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel. The mobile station is kept in the test mode by Layer 3 signaling).

7. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, Walding, Dipperstein and Gillespie as applied to claim 32 above and further in view of Gopalakrishnan et al. (US PAT 7110466, hereinafter Gopalakrishnan).

In regards to claim 34 Numminen teaches auxiliary channels being used for signaling (column 11 lines 4-6, traffic and control channels and column 6 lines 54-56, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station).

Numminen, Walding, Dipperstein and Gillespie do not explicitly teach auxiliary channels comprise at least one of an acknowledgment (ACK) channel and a data rate control (DRC) channel

Gopalakrishnan in the same field of endeavor teaches control channel (auxiliary channel) being DRC channel (column 1 lines 42-43).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen, Walding, Dipperstein and Gillespie's system/method by incorporating the steps of control channel being DRC channel as suggested by Gopalakrishnan. The motivation is that (as suggested by Gopalakrishnan, column 1 lines 42-48) the pilot/DRC channel is transmitted by the mobile to provide the base station with a pilot signal that the base station uses to reliably demodulate other transmissions from the mobile to the base station and further the pilot/DRC is also used to provide the base station with data rate request information from the mobile to efficiently control transmission rate. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

8. Claims 59 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen in view of Tiedemann.

In regards to claim 59 Numminen teaches sending a first message having included therein test settings (column 7 lines 46-47 and column 7 lines 59-61 and column 9 lines 10-11, at first the test equipment sends a comparison and statistical operation start command associated with the data channel. The mobile station activates the test loop in a certain time after it has sent the acknowledge) selected for the reverse traffic channel (column 7 line 42 and column 8 line 67, transmission channel tested is a HSCSD-type data channel); receiving a plurality of test packets (column 8 lines 4-7,

once the G loop has been activated the test equipment can start sending test data) on the traffic channel (column 8 lines 4-6, Once the G loop has been activated the test equipment can start sending test data, i.e. periods of a pseudorandom bit sequence packed in downlink frames) and determining a packet error rate based on information included in plurality of test packets (column 1 lines 41-43, The SS examines whether the transmission or the operation of the mobile station caused errors in the frame).

Numminen does not explicitly teach receiving a plurality of test packets at a plurality of rates, the plurality of test packets comprising information for plurality of rates being tested and updating a plurality of variables maintained for a plurality of rates based on the rates of the received test packets. Numminen does not explicitly teach determining a packet error based on the information included in plurality of test packets for the plurality of rates.

Tiedemann in the same field of endeavor teaches updating a plurality of variables maintained for the plurality of rates based on the rates of the received test packets (column 14 lines 40-57). Tiedemann in the same field of endeavor teaches receiving a plurality of test packets at a plurality of rates (abstract, Each data packet is assigned one of a multiplicity of data rates in accordance with a first pseudorandom process, and is then transmitted at the data rate assigned thereto), the plurality of test packets comprising information for plurality of rates being tested (column 9 lines 30-33 and TABLE II, Referring now to TABLE II, there are listed the number of bits included within the sequences comprising a set of exemplary data packets transmitted at various data rates). Tiedemann in the same field of endeavor teaches determining a packet error

based on the information included in plurality of test packets for the plurality of rates (column 10 lines 36-44, Subsequent to identification of the data rate associated with a particular received frame, the test data replication circuit 50 supplies a locally-generated packet of test data of the appropriate type to the digital comparator 49. Specifically, a frame category indicative of either a Rate 1, Rate 1/2, Rate 1/4, Rate 1/8, Blank, Rate 1 with Bit Error or an Insufficient Frame Quality is provided by the circuit 50 to comparator 49).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's system/method by incorporating the steps of receiving a plurality of test packets at a plurality of rates, the plurality of test packets comprising information for plurality of rates being tested and updating a plurality of variables maintained for the plurality of rates based on the rates of the received test packets and determining a packet error based on the information included in plurality of test packets for the plurality of rates as suggested by Tiedemann. The motivation is that by updating various variables related to communication link status, a node keeps an up-to-date information of the current condition of the links; thus enabling it to modify, most efficiently and reliably, link parameters to enable seamless communication. Further motivation is that by testing communication link at various data rates a node can get an accurate picture of the current condition of the link; thus enabling it to modify, most efficiently and reliably, link parameters related to rates to enable seamless communication. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market

forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 60 Numminen teaches for each received test packet, updating a first variable based on a sequence number of the test packet (column 8 lines 30-80 and column 8 lines 30-80).

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakadura and Engbersen as applied to claim 8 above and further in view of Funk.

In regards to claim 9, Sakadura and Engbersen teach sending loopback packet as described in the rejections of claim 8 above.

Sakadura and Engbersen do not explicitly teach one loop back packet is formed for each particular time interval.

Funk in the same field of endeavor teaches (Column 3 lines 61-67) test packets being formed for particular time interval.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sakadura and Engbersen's method by incorporating one loop back packet being formed for each particular time interval as taught by Funk. The motivation is that generating and sending test packets at regular interval helps to diagnose a communication system very efficiently and effectively. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

10. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakadura and Engbersen as applied to claim 6 above and further in view of Buchholz et al. (US PAT 5555266), hereinafter referred to as Buchholz.

In regards to claim 24, Sakadura and Engbersen teach loopback packets as described in the rejections of claim 6 above.

Sakadura and Engbersen do not explicitly teach each packet on the second data transmission includes a parameter value indicative of omission of one or more packets received on the first data transmission.

Buchholz in the same field of endeavor teaches in response to the receipt of a data packet (310) from a remote unit (112), the communications controller (110) identifies missing data within the data packet transmission, determines whether communication resources are available to support retransmission of the missing data, and if so, transmits a response to the requesting remote unit identifying the missing data.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sakadura and Engbersen's system by incorporating the method of notifying sender about missing data as taught by Buchholz. The motivation is that such method will accurately notify the sender about any problems in the communication link, which results in loss of packets; thus making the network more reliable. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market

forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

11. Claims 61-63 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, in view of Kobayasi et al. (US PAT 999), hereinafter referred to as Kobayasi and Sjoblom (US PAT PUB 2002/0009053).

In regards to claims 61-63 and 65 Numminen teaches receiving a plurality of test packets of known test data (column 1 lines 36-37 and column 8 lines 6-12, a mobile station receives a downlink frame from the SS, i.e. SS sends a first data channel transmission. In an alternative embodiment the information bits in the downlink frames may also include non-random bit combinations which will be particularly examined for reception errors. Naturally the mobile station tested must know about the use of such bit combinations just as it knows about the use of the pseudorandom bit sequences) via a forward traffic channel, forming a plurality of loop back packets for the plurality of received test packets, wherein each loop back packet covers zero or more test packets; and transmitting the loop back packets via reverse traffic channel (column 1 lines 37-39, a mobile station receives a downlink frame from the SS and sends back to the SS a corresponding uplink frame which contains the equivalent number of bits. The mobile station may even recycle to the SS the same individual bits that it received in the downlink direction).

Numminen does not explicitly teach identifying a transmission source of each received packet; packet excluding known test data includes the transmission source of

each covered test packet and forming a plurality of loop back packets includes the source number of each covered test packet. In regards to claim 62 and 65 Numminen does not explicitly teach a queue for the test packets.

Kobayasi in the same field of endeavor teaches, (column 2 lines 55-67) a test being started by issuing a test connectionless packet transmission request message (test start request) from the OS center 1 to SW station 3. The request message contains an identification information ID indicating terminal SW station 6. SW station 3 generates a test packet with the identification address of terminal SW station 6 set as its destination address DA and the identification address of its home station (SW station 3) set as its source address SA. The test packet is output to terminal SW station 6. In SW stations 4 and 5, test packets are processed as normal packets and transferred to terminal SW station 6. On receipt of the test packet, terminal SW station 6 outputs the packet with its DA and SA inverted. That is, the packet is returned from terminal SW station 6 to SW station 3, and it is reported to the OS center 1 upon re-arrival of the packet at the source SW station 3. Kobayasi teaches (column 97 lines 45-46) Loopback of a test cell is done in a 156 Mbps cell highway. In regards to claims 62 and 65 Kobayasi teaches buffers (fig 132) for data packets.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's teaching by incorporating the loopback test scheme as taught by Kobayasi. The motivation is that (as suggested by Kobayasi column 317 lines 29-34) the present invention realizes an efficient test within a short time by performing a test cell loopback check, which has been made in a test device,

through a test program in the switch. Additionally, transmitting cell data from a test device requires no testing units because the loopback jig can replace the testing units. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Numminen and Kobayasi do not explicitly teach identifying sequence number in test packets and forming test packets including the sequence number.

Sjoblom in the same field of endeavor teaches identifying sequence number in test packets and forming test packets including the sequence number (paragraphs 0023 and 0026).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Kobayasi's teaching by incorporating the steps of identifying sequence number in test packets and forming test packets including the sequence number as suggested by Sjoblom. The motivation is that the sequence number SN is a serial number assigned to a transferred cell for convenience in detecting the cell if it is lost or mistakenly inserted; thus enabling a reliable communication. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 61 Numminen teaches a receive data processor (figure 3 element 304), a transmit data processor (figure 3 element 310) and a controller (figure 3 element 307).

12. Claims 45 and 56, are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, in view of Tiedemann.

In regards to claim 45 and 56 Numminen teaches receiving a plurality of test packets via a forward traffic channel (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station. Particularly the immediate assignment 503 contains so-called test octets in which the first two bits indicate the contents of the test of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values can be reserved to indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode).

Numminen does not explicitly teach selecting rates for the test packets based on a set of rules for rate selection scheme, and transmitting the test packets at the selected rates on the traffic channel. Numminen does not explicitly teach the plurality of test packets comprising information for a plurality of rates being tested for the traffic channel.

Tiedemann in the same field of endeavor teaches the system allows the test sequence of digital data to be transmitted at one of a set of known data rates, with the receive station being disposed to identify the data rate associated with each test sequence of digital data. In a preferred implementation transmission of the test sequence involves generating a first plurality of data packets, which collectively comprise the test sequence of digital data. Each data packet is assigned one of a multiplicity of data rates in accordance with a first pseudorandom process, and is then transmitted at the data rate assigned thereto (abstract). Tiedemann in the same field of endeavor teaches plurality of test packets comprising information for a plurality of rates being tested for the traffic channel (column 9 lines 30-33 and TABLE II, Referring now to TABLE II, there are listed the number of bits included within the sequences comprising a set of exemplary data packets transmitted at various data rates). Tiedemann in the same field of endeavor teaches determining a packet error based on the information included in plurality of test packets for the plurality of rates (column 10 lines 36-44, Subsequent to identification of the data rate associated with a particular received frame, the test data replication circuit 50 supplies a locally-generated packet of test data of the appropriate type to the digital comparator 49. Specifically, a frame category indicative of either a Rate 1, Rate 1/2, Rate 1/4, Rate 1/8, Blank, Rate 1 with Bit Error or an Insufficient Frame Quality is provided by the circuit 50 to comparator 49). The current claim language states, "forming a plurality of test packets ...plurality of test packets comprising information for a plurality of rates being tested ...". The claim does not state each packet has multiple rates information, rather plurality of packets have

multiple rates information. Further, Examiner points out that Tiedemann in the same field of endeavor teaches the system allows the test sequence of digital data to be transmitted at one of a set of known data rates, with the receive station being disposed to identify the data rate associated with each test sequence (test sequence being information for rate being tested) of digital data (i.e. rate information is the unique sequence test bits per frame that tells about the particular rate being tested). In a preferred implementation transmission of the test sequence involves generating a first plurality of data packets, which collectively comprise the test sequence (test sequence being information for rate being tested) of digital data. Each data packet is assigned one of a multiplicity of data rates in accordance with a first pseudorandom process, and is then transmitted at the data rate assigned thereto (abstract). Tiedemann in the same field of endeavor teaches plurality of test packets comprising information for a plurality of rates being tested for the traffic channel (column 9 lines 30-33 and TABLE II, Referring now to TABLE II, there are listed the number of bits included within the sequences (sequence being information for rate being tested) comprising a set of exemplary data packets transmitted at various data rates). Table II clearly shows rate is function of Test bits per frame. As such, each packet containing number of test bits per frame is, the cited information about its rate being carried by the packet.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's teaching by incorporating the steps of selecting rates for the test packets based on a set of rules for rate selection scheme, and transmitting the test packets at the selected rates on the traffic channel. The

motivation is that The motivation is that by testing communication link at various data rates a node can get an accurate picture of the current condition of the link; thus enabling it to modify, most efficiently and reliably, link parameters related to rates to enable seamless communication. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

13. Claims 49-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen and Tiedemann as applied to claim 45 above and further in view of Kobayasi.

In regards to claims 50-52 Numminen and Tiedemann teaches a testing system as described in the rejections of claim 45 above.

In regards to claims 50-52 Numminen and Tiedemann do not explicitly teach of having protocol type, packet type, number of records field, time interval, source address, sequence number in the test packet.

In regards to claims 50 and 51 Kobayasi discloses protocol type, packet type, number of records field, time interval, source address, sequence number in the packets shown in FIGS. 582 through 628. In regards to claim 52 Kobayasi teaches (column 3 lines 5-10) that since the source SW station 3 and the terminal SW station 6 mark the time stamp onto the payload field of the packet, the OS center 1 is informed of the transmission time of packets according to the information.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Tiedemann's teaching by incorporating the loopback test scheme as taught by Kobayasi. The motivation is that (as suggested by Kobayasi column 317 lines 29-34) the present invention realizes an efficient test within a short time by performing a test cell loopback check, which has been made in a test device, through a test program in the switch. Additionally, transmitting cell data from a test device requires no testing units because the loopback jig can replace the testing units. Further motivation (as suggested by Numminen, column 11 lines 5-8) is that the invention can also be modified in many ways without departing from the scope of the invention defined by the claims. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 53, Numminen and Tiedemann do not explicitly teach field indicative of whether any loop back packets were lost due to buffer overflow.

Kobayasi in the same field of endeavor teaches, (column 2 lines 55-67) a test being started by issuing a test connectionless packet transmission request message (test start request) from the OS center 1 to SW station 3. The request message contains an identification information ID indicating terminal SW station 6. SW station 3 generates a test packet with the identification address of terminal SW station 6 set as its destination address DA and the identification address of its home station (SW station 3) set as its source address SA. The test packet is output to terminal SW station 6. In SW

stations 4 and 5, test packets are processed as normal packets and transferred to terminal SW station 6. On receipt of the test packet, terminal SW station 6 outputs the packet with its DA and SA inverted. That is, the packet is returned from terminal SW station 6 to SW station 3, and it is reported to the OS center 1 upon re-arrival of the packet at the source SW station 3. Kobayasi further teaches the L2-PDU shown in FIG. 783 is an example of a BOM cell. The 2 bytes preceded by the header field stores a segment type ST, sequence number SN, and message identifier MID (or a multiplex identifier). The sequence number SN is a serial number assigned to a transferred cell for convenience in detecting the cell if it is lost or mistakenly inserted.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Tiedemann's system/method by incorporating the steps of having source id and sequence number in test packets as taught by Kobayasi. The motivation is that having a source and sequence number enables a system to easily and efficiently identify the source of the test packets and number of packets received or lost due to overflow for statistical record keeping. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 49 Numminen teaches the first message includes an indication of maintenance of a test mode on the traffic channel in event of a connection closure or a lost connection (column 7 lines 18-20, So test mode means

that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel. The mobile station is kept in the test mode by Layer 3 signaling).

14. Claims 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen and Tiedmann as applied to claim 45 above, and further in view of Ikeda (US PAT 5636212).

In regards to claims 46 and 47 Numminen and Tiedmann teach a method for testing one or more channels in a wireless data communication system as described in the rejections of claim 45 above.

Numminen and Tiedmann do not explicitly teach message having maximum and minimum rate for rate selection.

Ikeda in the same field of endeavor teaches (column 8 lines 38-39) reservation request being issued with a maximum band-width and a minimum band-width.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Tiedmann's system/method by incorporating the concept of sending maximum band-width and a minimum band-width via message as taught by Ikeda. The motivation is that (as suggested by Ikeda, column 2 lines 5-10) to provide a flexible method of reserving a band-width for a burst capable of flexibly reserving a band-width according to a maximum band-width and a minimum band-width requested for reservation. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design

incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 48, Numminen and Tiedmann do not explicitly teach with the steps of the selected rates for the test packets being further limited by a maximum rate specified by a media access control (MAC) protocol

It would have been obvious of one of ordinary skill in the art at the time of invention to modify Numminen and Tiedmann's system/method with the steps of the selected rates for the test packets being further limited by a maximum rate specified by a media access control (MAC) protocol; as a link defined to have a maximum bandwidth rate cannot operate in a higher bandwidth which may cause overflow of data in buffers and in result cause loss of packets. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

15. Claims 40-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen in view of Oommen et al. (US PAT 6799203) and Tiedemann.

In regards to claims 40-44 Numminen teaches receiving a plurality of test packets via a forward traffic channel as described in the rejections of claim 1 above. In regards to claims 40, 41, 42 and 43 Numminen teaches a method of collecting data for a first parameter while in idle state and not exchanging data via the link (column 10 lines 1-8, In addition to the testing described above the invention is applicable when a

mobile station or a terminal of a cellular radio system in general is in normal use, i.e. moving with its user within the area of the cellular radio system. Then it is for most of the time in the so-called idle mode (i.e. idle state) in which it receives from base stations certain downlink messages and sends occasionally location update messages (i.e. collecting data for a first parameter "location area") uplink. The cellular radio system knows at all times the location of every idling mobile station (i.e. first statistics being transmitted data of "location area" for every idling mobile station) with the accuracy of a so-called location area (LA) at least). Numminen teaches collecting a second statistic for a second parameter different from the first parameter while in connected state and exchanging data via the link (column 7 lines 46-47 and column 7 lines 59-61, column 9 lines 10-11 and column 8 lines 29-39, while the G loop is active the mobile station compares the received bit sequence portions to the locally produced portions and measures e.g. the bit error ratio or frame erasure ratio and compiles statistics of the measurement results in a desired manner. Complete statistics or information elements representing the reception error status in general are sent uplink to the test equipment. At first the test equipment sends a comparison and statistical operation start command associated with the data channel. The mobile station activates the test loop in a certain time after it has sent the acknowledge). Numminen teaches receiving a first message requesting the first or second statistic, and sending a second message with the requested first or second statistic (column 8 lines 29-39, while the G loop is active the mobile station compares the received bit sequence portions to the locally produced portions and measures e.g. the bit error ratio or frame erasure ratio and compiles

statistics of the measurement results in a desired manner. Complete statistics or information elements representing the reception error status in general are sent uplink to the test equipment).

In regards to claims 40-43 Numminen does not explicitly teach, collecting statistics during each of the transactions.

Oommen in the same field of endeavor teaches (column 2 lines 46-49) OTAMD involves requesting statistics and performing diagnostic tests in the MS using a command issued from the network for testing purpose.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's teaching by incorporating the statistic gathering during transactions as taught by Oommen. The motivation is that by collecting statistics real-time while testing is being performed enables a reliable and up-to-date statistic collection process to check network reliability. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claims 40 and 44, Numminen and Oommen do not explicitly teach collecting the first statistic occurs while performing testing.

Tiedemann in the same field of endeavor teaches collecting the first statistic occurs while performing testing function (column 14 lines 40-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Oommen's teaching by incorporating the

steps of collecting the first statistic occurs while performing testing as taught by Oommen. The motivation is that by collecting statistics real-time while testing is being performed enables a reliable and up-to-date statistic collection process to check network reliability. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 44, Numminen teaches a memory (column 7 line 27, memory media) communicatively coupled to a digital signal processing device (DSPD) (column 7 line 26, a microprocessor).

16. Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakadura and Engbersen as applied to claim 6 above and further in view of Kobayasi.

Sakadura and Engbersen teach a method for testing one or more channels in a wireless data communication system, comprising: receiving a plurality of test packets via a forward traffic channel as described in the rejections of claim 6 above.

Sakadura and Engbersen do not explicitly teach field indicative of whether any loop back packets were lost due to buffer overflow and a field indicative of a number of MAC packets received in a Physical Layer packet containing the test packet covered by the record.

Kobayasi in the same field of endeavor teaches, (column 2 lines 55-67) a test being started by issuing a test connectionless packet transmission request message (test start request) from the OS center 1 to SW station 3. The request message contains an identification information ID indicating terminal SW station 6. SW station 3 generates a test packet with the identification address of terminal SW station 6 set as its destination address DA and the identification address of its home station (SW station 3) set as its source address SA. The test packet is output to terminal SW station 6. In SW stations 4 and 5, test packets are processed as normal packets and transferred to terminal SW station 6. On receipt of the test packet, terminal SW station 6 outputs the packet with its DA and SA inverted. That is, the packet is returned from terminal SW station 6 to SW station 3, and it is reported to the OS center 1 upon re-arrival of the packet at the source SW station 3. Kobayasi further teaches the L2-PDU shown in FIG. 783 is an example of a BOM cell. The 2 bytes preceded by the header field stores a segment type ST, sequence number SN, and message identifier MID (or a multiplex identifier). The sequence number SN is a serial number assigned to a transferred cell for convenience in detecting the cell if it is lost or mistakenly inserted.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sakadura and Engbersen's system/method by incorporating the steps of having source id and sequence number in test packets as taught by Kobayasi. The motivation is that having a source and sequence number enables a system to easily and efficiently identify the source of the test packets and number of packets received or lost due to overflow for statistical record keeping. Known

work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Allowable Subject Matter

17. Claims 1, 2, 5, 57, 58, 64 and 66 are allowed.
18. Claims 54 and 55 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

19. Applicant's arguments see pages 17-48 of the Remarks section, filed 12/10/2008, with respect to the rejections of the claims have been fully considered.

Claim 32:

Applicant argues that (see page 24) Dipperstein does not provide selected test settings that "comprise indications for configuring the reverse traffic channel, one or more auxiliary channels, or a combination thereof..." However, Examiner respectfully disagrees with the Applicant's assertion. Dipperstein does indeed teach the cited limitations. Specifically, Dipperstein teaches a test settings comprise indications for configuring the reverse traffic channel, one or more auxiliary channels, or a combination thereof and indications of loop back packet transmission procedures to be performed during testing (column 3 lines 11-17, claims 6, 13 and 14, In accordance with the eoc-

based message exchange sequence, a user or craftsperson operating a sourcing test set (as an LT device at the central office) activates a MENU key on the test set keypad, which causes the test set's LCD display panel to display a list of options (i.e. test settings indications) available to the user, one of which is a bit error test (BERT). in response to a user invoking an input/output element of test set associated with a bit error test, conducting a command-response message (i.e. message having test setting indications) exchange over auxiliary ISDN channel, through which device clears loopbacks, and then loops back one or more ISDN bearer channels (i.e. reverse traffic channel), and supervisory control processor is operative, in response to a user invoking an input/output element of test set associated with a bit error test, to conduct a command-response message exchange over auxiliary ISDN channel, through which device clears loopbacks, and then loops back one or more ISDN bearer channels (i.e. reverse traffic channel) and, in response to far end device looping back one or more bearer channels (i.e. reverse traffic channel), conducting a bit error rate test over looped back one or more bearer channels (i.e. reverse traffic channel), and providing an indication of a result of bit error rate test supervisory control processor is operative, in response to a user invoking an input/output element of test set associated with a bit error test, to provide a list of prescribed test parameter options (i.e. test settings indications) for entry by the user and, in response to said user entering test parameter options, to transmit a first command message over auxiliary ISDN channel instructing device to clear loopbacks and, in response to device clearing loopbacks, to transmit a

second command message over auxiliary ISDN channel instructing device to loop back said one or more ISDN bearer channels).

Applicant argues (page 24) that The Dipperstein passages say nothing about "a first message having included therein test settings selected from a plurality of possible test settings, wherein the test settings selected comprise indications for configuring each auxiliary channel and indications of procedures to be performed by each auxiliary channel during testing ..." as required by claim 32. However, Examiner respectfully submits that, Numminen teaches receiving a first message having included therein test settings selected *from among a plurality of possible test settings* (column 7 lines 18-20 and column 11 lines 4-6, test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel (i.e. data, traffic or control channel). Applicability of the invention to all mobile communication systems in which a mobile station can operate on data, traffic and control channels (i.e. plurality of possible test settings are related to testing data, traffic or control channel)) for one or more auxiliary channels (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, (after selecting data, traffic or control channel) the test equipment sends an immediate assignment 503 which may include various instructions (i.e. record) for the mobile station. Particularly the immediate assignment 503 contains so-called test octets (i.e. record) in which the first two bits indicate the contents of the test of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values

can be reserved to indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode); configuring each auxiliary channel based on test settings applicable to the auxiliary channel (column 7 lines 46-50, At first the test equipment sends a comparison and statistical operation start command associated with the data channel, which command can be called CLOSE_Multi-slot_loop_CMD. The close command may include an identifier on the basis of which the mobile station identifies the G loop. Numminen further teaches (column 11 lines 4-6) mobile station can perform testing on traffic and control channels (i.e. auxiliary channel) as well); and transmitting each configured auxiliary channel on reverse link in accordance with the applicable test settings (column 2 lines 24-31, The method according to the invention is characterized in that it is comprised of steps wherein a test signal is received in the downlink direction, the test signal received is compared with a known form of the test signal, information produced by the comparison about errors detected in the received test signal is stored, and a signal representing the information stored is sent uplink) to test the configured auxiliary channel (column 7 lines 18-20 and column 11 lines 4-6, test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel. Applicability of the invention to all mobile communication systems in which a mobile station can operate on data, traffic and control channels (i.e. overhead or auxiliary channels)). Numminen teaches in column 1 lines 35-40, Tests usually employ a technique in which a mobile station receives a downlink frame from the SS and sends back to the SS a corresponding uplink frame which contains the equivalent number of bits. The mobile

station may even recycle to the SS the same individual bits that it received in the downlink direction. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues (pages 24-26) that Numminen fails to receive a first message having test settings selected from a plurality of possible test settings, but simply provides a "test Signal" on the forward link and compares the signal to a known test signal, with no test settings provided as required by the claim language; Numminen, having not received the requisite test settings, cannot configure one or more channels based on selected test settings. However, Examiner respectfully disagrees with the Applicant's assertion. Numminen does indeed teach the cited limitations. Specifically, Numminen teaches receiving a first message having included therein test settings selected *from among a plurality of possible test settings* (column 7 lines 18-20 and column 11 lines 4-6, test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel (i.e. data, traffic or control channel). Applicability of the invention to all mobile communication systems in which a mobile station can operate on data, traffic and control channels (i.e. plurality of possible test settings are related to testing data, traffic or control channel)) for one or more auxiliary channels (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, (after selecting data, traffic or control channel) the test equipment sends an immediate

assignment 503 which may include various instructions (i.e. record) for the mobile station. Particularly the immediate assignment 503 contains so-called test octets (i.e. record) in which the first two bits indicate the contents of the test of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values can be reserved to indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode); configuring each auxiliary channel based on test settings applicable to the auxiliary channel (column 7 lines 46-50, At first the test equipment sends a comparison and statistical operation start command associated with the data channel, which command can be called CLOSE_Multi-slot_loop_CMD. The close command may include an identifier on the basis of which the mobile station identifies the G loop. Numminen further teaches (column 11 lines 4-6) mobile station can perform testing on traffic and control channels (i.e. auxiliary channel) as well); and transmitting each configured auxiliary channel on reverse link in accordance with the applicable test settings (column 2 lines 24-31, The method according to the invention is characterized in that it is comprised of steps wherein a test signal is received in the downlink direction, the test signal received is compared with a known form of the test signal, information produced by the comparison about errors detected in the received test signal is stored, and a signal representing the information stored is sent uplink) to test the configured auxiliary channel (column 7 lines 18-20 and column 11 lines 4-6, test mode means that the mobile station to be tested is

instructed to maintain a connection on a certain transmission channel. Applicability of the invention to all mobile communication systems in which a mobile station can operate on data, traffic and control channels (i.e. overhead or auxiliary channels)). Numminen teaches in column 1 lines 35-40, Tests usually employ a technique in which a mobile station receives a downlink frame from the SS and sends back to the SS a corresponding uplink frame which contains the equivalent number of bits. The mobile station may even recycle to the SS the same individual bits that it received in the downlink direction..

It is for the same reasons, Examiner respectfully disagrees with the Applicant's assertion (see pages 24-26) that Numminen fails to perform material requirements in claim 32, including but not limited to receiving a first message having the required test settings, and configuring auxiliary channels based on selected test settings in the first message.

It is for the same reasons, Examiner respectfully disagrees with the Applicant's assertion (see pages 24-26) that no message is provided by the Numminen design that includes selected test settings as the term "test settings" is used in the claim.

Applicant argues (pages 24-26) that Dipperstein does not disclose or suggest providing indications on configuring a auxiliary channel, as that term is commonly understood and employed in the current specification. Configuring a auxiliary channel is discussed at various places in the current specification. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., pages 24-26 or Remark

seciton) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues that Dipperstein provides for certain "parameters" to be specified, but these parameters have nothing to do with configuring the auxiliary channel. However, Examiner respectfully disagrees with the Applicant's assertion. Dipperstein does indeed teach the cited limitations. Specifically, Dipperstein teaches a test settings comprise indications for configuring the reverse traffic channel, one or more auxiliary channels, or a combination thereof and indications of loop back packet transmission procedures to be performed during testing (column 3 lines 11-17, claims 6, 13 and 14, In accordance with the eoc-based message exchange sequence, a user or craftsperson operating a sourcing test set (as an LT device at the central office) activates a MENU key on the test set keypad, which causes the test set's LCD display panel to display a list of options (i.e. test settings indications) available to the user, one of which is a bit error test (BERT). in response to a user invoking an input/output element of test set associated with a bit error test, conducting a command-response message (i.e. message having test setting indications) exchange over auxiliary ISDN channel, through which device clears loopbacks, and then loops back one or more ISDN bearer channels (i.e. reverse traffic channel), and supervisory control processor is operative, in response to a user invoking an input/output element of test set associated with a bit error test, to conduct a command-response message exchange over auxiliary ISDN channel, through which device clears loopbacks, and then loops back one or

more ISDN bearer channels (i.e. reverse traffic channel) and, in response to far end device looping back one or more bearer channels (i.e. reverse traffic channel), conducting a bit error rate test over looped back one or more bearer channels (i.e. reverse traffic channel), and providing an indication of a result of bit error rate test supervisory control processor is operative, in response to a user invoking an input/output element of test set associated with a bit error test, to provide a list of prescribed test parameter options (i.e. test settings indications) for entry by the user and, in response to said user entering test parameter options, to transmit a first command message over auxiliary ISDN channel instructing device to clear loopbacks and, in response to device clearing loopbacks, to transmit a second command message over auxiliary ISDN channel instructing device to loop back said one or more ISDN bearer channels). In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that Col 7 lines 18-20 and col 11 lines 4-6 in Numminen simply say that the mobile station maintains a connection on a certain transmission channel. However, Examiner respectfully disagrees with the Applicant's interpretation of the cited portion of Numminen. The cited portion teaches applicability of the invention to all mobile communication systems in which a mobile station can operate on data, traffic and control channels. As such, the inventive step of testing as disclosed by Numminen

can be operated on data, traffic and control channels for all mobile stations in a mobile communication system.

Applicant argues that (page 24) Numminen does not show "configuring the at least one or more channels based on the selected test settings..." as required by claim 1, as amended. However, Examiner respectfully disagrees with the Applicant's assertion. Numminen does indeed teach the cited limitations. Specifically, Numminen teaches *configuring the one or more channels based on the selected test settings in the first message* (column 7 lines 46-47 and column 7 lines 59-61 and column 9 lines 10-11, at first the test equipment sends a comparison and statistical operation start command associated with the data channel (i.e. associating a command with a particular data channel, leaving other data channels alone satisfies the limitation *selected test settings* (selecting a particular data channel for testing)). The mobile station activates the test loop in a certain time after it has sent the acknowledge).

Regardless, a new ground of rejection is presented in this office action. As such, any further response to Applicant's argument to claim 32 is moot.

Claim 56, 59 and 45:

Applicant argues (see page 31 paragraph 3) that Tiedemann does not teach "the plurality of test packets comprising information for a plurality of rates being tested for the reverse traffic channel." However, Examiner respectfully disagrees with the Applicant's assertion. Numminen in combination with Tiedemann do indeed teach the cited limitations. Specifically, Numminen teaches sending a first message having

included therein test settings (column 7 lines 46-47 and column 7 lines 59-61 and column 9 lines 10-11, at first the test equipment sends a comparison and statistical operation start command associated with the data channel. The mobile station activates the test loop in a certain time after it has sent the acknowledge) selected for the reverse traffic channel (column 7 line 42 and column 8 line 67, transmission channel tested is a HSCSD-type data channel); receiving a plurality of test packets (column 8 lines 4-7, once the G loop has been activated the test equipment can start sending test data) on the traffic channel (column 8 lines 4-6, Once the G loop has been activated the test equipment can start sending test data, i.e. periods of a pseudorandom bit sequence packed in downlink frames) and determining a packet error rate based on information included in plurality of test packets (column 1 lines 41-43, The SS examines whether the transmission or the operation of the mobile station caused errors in the frame). Numminen does not explicitly teach receiving a plurality of test packets at a plurality of rates, the plurality of test packets comprising information for plurality of rates being tested and updating a plurality of variables maintained for a plurality of rates based on the rates of the received test packets. Numminen does not explicitly teach determining a packet error based on the information included in plurality of test packets for the plurality of rates. Tiedemann in the same field of endeavor teaches updating a plurality of variables maintained for the plurality of rates based on the rates of the received test packets (column 14 lines 40-57). Tiedemann in the same field of endeavor teaches receiving a plurality of test packets at a plurality of rates (abstract, Each data packet is assigned one of a multiplicity of data rates in accordance with a first pseudorandom

process, and is then transmitted at the data rate assigned thereto), the plurality of test packets comprising information for plurality of rates being tested (column 9 lines 30-33 and TABLE II, Referring now to TABLE II, there are listed the number of bits included within the sequences comprising a set of exemplary data packets transmitted at various data rates). Tiedemann in the same field of endeavor teaches determining a packet error based on the information included in plurality of test packets for the plurality of rates (column 10 lines 36-44, Subsequent to identification of the data rate associated with a particular received frame, the test data replication circuit 50 supplies a locally-generated packet of test data of the appropriate type to the digital comparator 49. Specifically, a frame category indicative of either a Rate 1, Rate 1/2, Rate 1/4, Rate 1/8, Blank, Rate 1 with Bit Error or an Insufficient Frame Quality is provided by the circuit 50 to comparator 49). The current claim language states, "forming a plurality of test packets ...plurality of test packets comprising information for a plurality of rates being tested ...". The claim does not state each packet has multiple rates information, rather plurality of packets have multiple rates information. Further, Examiner points out that Tiedemann in the same field of endeavor teaches the system allows the test sequence of digital data to be transmitted at one of a set of known data rates, with the receive station being disposed to identify the data rate associated with each test sequence (test sequence being information for rate being tested) of digital data (i.e. rate information is the unique sequence test bits per frame that tells about the particular rate being tested). In a preferred implementation transmission of the test sequence involves generating a first plurality of data packets, which collectively comprise the test sequence (test

sequence being information for rate being tested) of digital data. Each data packet is assigned one of a multiplicity of data rates in accordance with a first pseudorandom process, and is then transmitted at the data rate assigned thereto (abstract). Tiedemann in the same field of endeavor teaches plurality of test packets comprising information for a plurality of rates being tested for the traffic channel (column 9 lines 30-33 and TABLE II, Referring now to TABLE II, there are listed the number of bits included within the sequences (sequence being information for rate being tested) comprising a set of exemplary data packets transmitted at various data rates). Table II clearly shows rate is function of Test bits per frame. As such, each packet containing number of test bits per frame is, the cited information about its rate being carried by the packet. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Claims 40-44:

Applicant argues (see page 41) that the combination of Numminen, Oommen and Tiedemann does not render claims 40 or 44 obvious, as the claims include limitations not shown by the cited combination. However, Examiner respectfully disagrees with the Applicant's assertion. Specifically, Numminen teaches a method of collecting data for a first parameter while in idle state and not exchanging data via the link (column 10 lines 1-8, In addition to the testing described above the invention is applicable when a mobile station or a terminal of a cellular radio system in general is in normal use, i.e. moving with its user within the area of the cellular radio system. Then it is for most of the time

in the so-called idle mode (i.e. idle state) in which it receives from base stations certain downlink messages and sends occasionally location update messages (i.e. collecting data for a first parameter "location area") uplink. The cellular radio system knows at all times the location of every idling mobile station (i.e. first statistics being transmitted data of "location area" for every idling mobile station) with the accuracy of a so-called location area (LA) at least). Numminen teaches collecting a second statistic for a second parameter different from the first parameter while in connected state and exchanging data via the link (column 7 lines 46-47 and column 7 lines 59-61, column 9 lines 10-11 and column 8 lines 29-39, while the G loop is active the mobile station compares the received bit sequence portions to the locally produced portions and measures e.g. the bit error ratio or frame erasure ratio and compiles statistics of the measurement results in a desired manner. Complete statistics or information elements representing the reception error status in general are sent uplink to the test equipment. At first the test equipment sends a comparison and statistical operation start command associated with the data channel. The mobile station activates the test loop in a certain time after it has sent the acknowledge). Numminen teaches receiving a first message requesting the first or second statistic, and sending a second message with the requested first or second statistic (column 8 lines 29-39, while the G loop is active the mobile station compares the received bit sequence portions to the locally produced portions and measures e.g. the bit error ratio or frame erasure ratio and compiles statistics of the measurement results in a desired manner. Complete statistics or information elements representing the reception error status in general are sent uplink

to the test equipment). In regards to claims 40-43 Numminen does not explicitly teach, collecting statistics during each of the transactions. Oommen in the same field of endeavor teaches (column 2 lines 46-49) OTAMD involves requesting statistics and performing diagnostic tests in the MS using a command issued from the network for testing purpose. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's teaching by incorporating the statistic gathering during transactions as taught by Oommen. The motivation is that by collecting statistics real-time while testing is being performed enables a reliable and up-to-date statistic collection process to check network reliability. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art. In regards to claims 40 and 44, Numminen and Oommen do not explicitly teach collecting the first statistic occurs while performing testing. Tiedemann in the same field of endeavor teaches collecting the first statistic occurs while performing testing function (column 14 lines 40-57). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Oommen's teaching by incorporating the steps of collecting the first statistic occurs while performing testing as taught by Oommen. The motivation is that by collecting statistics real-time while testing is being performed enables a reliable and up-to-date statistic collection process to check network reliability. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other

market forces/market place incentives if the variations are predictable to one of ordinary skill in the art. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claims 61-63 and 65:

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Rest of the claims:

A new ground of rejections is presented in this office action. As such, any further response to Applicant's argument is moot.

Combination of References:

In response to Applicant's arguments, Examiner respectfully submits that the following are some rationales which have been used when formulating a 103 rejection:

- (1)Combining prior art elements according to known methods to yield predictable results.
- (2) Simple substitution of one known element for another to obtain predictable results.

(3) Use of known techniques to improve similar devices (methods or products) in the same way.

(4) Applying a known technique to a known device (method or product) ready for improvement to yield predictable results.

(5) "Obvious to try" – choosing from a finite number of identified, predictable solutions.

(6) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

(7) The TSM test. (Although the Supreme Court cautioned against an overly rigid application of TSM, it also recognized that TSM was one of a number of valid rationales that could be used to determine obviousness)

In response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALMAN AHMED whose telephone number is (571)272-8307. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Salman Ahmed/
Examiner, Art Unit 2419